

The Canadian Coal Export Outlook in APEC Regions

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Introduction

It is my pleasure to address the 6th APEC Coal Flow Seminar. This remains an important meeting of APEC member economies and private sector representatives and always results in high quality analysis of key issues.

I will be speaking about the Canadian coal industry and more specifically the export sector and the relationship to the Asia Pacific. Canada has been a supplier of coal to the region for a significant period of time and therefore I have chosen to speak about major issues and changes affecting Canadian producers. I will draw implications for coal supply to Asia Pacific from Canada out of that discussion.

History records the use of local coal in the Maritime provinces in the 1600s and the production and use of coal in Canada has continuously played a significant role in the Canadian economy ever since.

The industry has a long history that is characterized by profound changes, many of which have been linked to technological change and innovation but which also involved government participation and changes in markets. Early in this century coal was used mainly for domestic heating, rail and marine transportation, for heating industrial boilers of all types and in steel making. By shortly after the middle of the century coal was essentially eliminated from use from all of these except steel making.

Canadian production and use of coal followed this trend with domestic production peaking at 18 million tonnes in 1950, and consumption peaking at 44 million tonnes in 1950. Both fell dramatically thereafter.

Beginning in the late 1960s a new era began for Canadian coal as large-scale coal-fired electricity generating stations were built and a new market for high quality metallurgical coal emerged in Asia. Canadian producers responded to the emergence and growth of new markets and production and exports grew steadily right into the 1990s.

Setting records became an annual event for the Canadian industry with new standards set regularly right up to 1996 and 1997 when records were set for total production, domestic consumption and exports.

This background forms the context for the discussion of the current dynamic nature of Canadian coal mining. One aspect of this dynamism is the change in technology and productivity. In the face of enormous competitive pressure coal producers have greatly improved productivity and lowered costs to not only stay in the business but also push increased tonnages into new markets. The overall capability to supply coal has grown over time and the cost of supply has tended to go down.

Another important industry dynamic is changing ownership and concentration which has created the trend to consolidation and fewer coal mining companies. The trend in Canada mirrors trends in other countries and this activity is having an influence on how business is transacted and how the future of coal mining will unfold. Ownership concentration tends to result from and contribute to the rationalization of production and the closure of higher cost suppliers.

Another dynamic, seemingly contradictory, is the ongoing activity related to undeveloped coal properties by newcomers. The rationale for this action is the development of new low cost supply that can potentially compete with existing producers based on special circumstances.

As this audience is well aware metallurgical coal price settlements are completed between producers and the Japanese steel industry and settlements were 5% down for Canadian hard coking coal. Signals indicate that similar reductions for semisoft coking coal are in the works. This means the major market for Canada's highest-valued export product continues to be depressed at the present time, and the outlook for steam coal is no better.

These events and circumstances signal the prospect of significant changes in the industry looking ahead.

Coal in Canada - Summary of Results for 1999

Coal Flow

Coal industry statistics have been positive in recent years although they trended down in 1999 as total Canadian coal production declined to 72.3 million tonnes (mt) from 75.4 in 1998. Approximately 19 mt were imported and approximately 33 mt exported. Total Canadian consumption at 58 mt continued to be robust as coal remains an essential fuel for electricity generation and steel making as well as important to cement manufacturing. (All figures are preliminary.)

The Canadian coal industry has distinct regional characteristics. Bituminous coal is produced for export in the mountain region of Alberta and British Columbia. Sub-bituminous coal and lignite are produced for domestic consumption on the prairies of Alberta and Saskatchewan and bituminous coal is produced for local consumption on the east coast. US and South American coal is imported into eastern Canada and represents a significant share of Canadian coal consumption (25%). Nova Scotia has become a significant coal importer as a result of problems in the mines in Cape Breton. The other new development on the import side has been the increasing import demand for western US sub-bituminous coal. Coal produced in Montana and Wyoming is now moving into Manitoba as well as northern and southern Ontario.

Exports

Canadian coal exports strengthened in the 1990s as producers aggressively pushed into areas that were once outside the margins of the market for their coal. The Asia Pacific region including Japan, Republic of Korea and Chinese Taipei remains the key market for Canadian coal with exports to those countries representing approximately 68% of the Canadian total. Developments in the major economies of Asia Pacific therefore remain very important influences on Canada.

Canadian companies have been enormously successful in extending the market for Canadian coal and have established sales in areas once considered beyond their reach. Exports now extend to over 20 countries. Metallurgical coal retained its major share in 1999 as met coal exports totaled 30 mt while thermal coal remained in the 3 mt range. (Figure 1)

Mining Technology & Productivity

In 1997/98 an independent agency published the results of a study of Canadian industrial

productivity for the period 1984-1995. According to that study, coal mining was Canada's leader in total factor productivity growth during the period, and exceeded all others including electrical products and telecommunications industries. The coal industry achieved growth in productivity of 9% per annum; dwarfing the gains in manufacturing for example and the economy as a whole.

The key to the productivity growth has been primarily technology-based although management and working practices have certainly improved over time as well. The industry has been investing \$300-400 million dollars per year on average since the mid-1980s and capital has been the main source of the productivity gains. This is illustrated in a comparison of annual production and total wages and salaries since the 1980s. While production has grown the labour bill has remained relatively stable or has grown more slowly. Fewer employees now produce more coal.

The increase in mining productivity has been augmented by gains in the transportation sector, notably rail, and is the basis for Canada's ongoing participation in a highly competitive international marketplace. The bases for the gains are described in the following paragraphs, which describe some of the technological changes in the industry.

Coal Mining

The evidence of technological advance in the industry lies in the trends in productivity and costs per tonne of coal produced. These indicators show how companies utilize new technology to drive costs down, compete, remain competitive and grow. Canada's coal mines are near the top in world productivity and western Canadian coal mines (95% of total production) taken as a group are the most productive of any major producing region.

Canadian developments in "geo-systems" which are computer-based geology and mine design and planning programs are amongst the best in the world. Canadian offerings in these areas compete against US, Australian and UK products and services.

Canadian companies are also leading in application of satellite-based Global Positioning Systems (GPS) in surface mines. The GPS developed in Canada has been utilized for automating drills and shovels and for truck dispatching in open pit coal mines in western Canada. (Figure 2)

Heavy-duty equipment, like haul trucks, now typically comes equipped with electronic monitoring devices of all kinds. The challenge for mines has been to capture the on-line monitor data, communicate it and analyze it. Canadian developments in data communication in mines are as strong as any in the world. In fact the largest mines are developing Local Area Networks (LAN) for this data communication. The networks also allow the downloading of mine plan data to shovels so the mine plans can literally be implemented in real time. Coalmines are involved along with oil sands mines in leading in this area. (Figure 3)

Equipment size of course continues to be a major advance as 360 ton and soon 400-ton trucks enter commercial service. Manufacturers are also testing and introducing innovative truck designs and Liebherr is one such manufacturer currently testing new design trucks in Canada.

The new large shovels are beginning to utilize electronic "memory systems" which have the capability to automate repetitive processes. The technologies will ultimately all come together in the form of autonomous or driver-less heavy-duty equipment.

Canadian companies are also involved in joint development contracts with equipment manufacturers. Although most of the heavy-duty mine trucks and shovels are manufactured outside Canada, prototyping and specialization is taking place in Canada. Equipment manufacturers like O&K, Caterpillar, P&H and Komatsu all have joint development contracts, which lead to new equipment models especially suited for Canadian conditions.

It is the size of the heavy equipment fleet in Canada that has led to these opportunities. The existing population and the prospects for growth in open pit mining mean that manufacturers are willing to support technology advances in Canada.

Other mine-related research is taking place in wear materials and the development of abrasion-resistant materials for mine equipment. This research is aimed at improving the operating life and performance of truck bodies, shovel teeth and tires. Canadian companies are working with National Research Council (NRC) and National Science and Engineering Research Council of Canada (NSERC) in this effort. Coal mining companies are also working in collaboration on areas of mutual interest the Surface Mining and Research Technology (SMART) group includes the major coal companies in western Canada.

Coal Preparation

Much of Canada's coal production and all the export coal requires some treatment prior to shipment. Process control is the integral operating area for optimizing product recovery and product specification as well as optimizing energy management and lowering costs.

Developments in this area are occurring in Programmable Logic Controller (PLC) and Direct Digital Control (DDC) systems. These applications are leading the progress toward fully automated plants and are used for sequential start-up, shutdown and re-start schemes and for monitoring and control of processes. Process control in the coal flotation circuits is using nuclear ash* monitoring systems. At least one mine has acted in collaboration with provincial government, CANMET and equipment designers to implement process control systems that integrate on-line ash monitoring using a nuclear ash monitoring system with the overall plant operating systems. Canadian designs are emerging from this work.

Transportation

The bulk commodities and the railways have a strong reciprocal dependence; each relies on the other for survival and success. On the one hand coal can only be transported long distances in Canada by rail while on the other hand it is the largest commodity by volume moved by rail in Canada and is therefore important to the railways' revenue.

Modern rail transportation of bulk commodities such as coal, requires highly efficient, cost effective carriage of the product and efficient management of the railway's overall traffic system.

New more powerful and more energy efficient locomotives are being utilized across the coal system and the payloads are increasing.

State-of-the-art traffic management and dispatching systems and more flexible work rules are also part of the improving transportation situation and importantly are being reflected in lower rail rates. Rail rates are now in the range of 25-30% of FOB coal prices.

Concentration of Ownership & Rationalization of Production

There have been other eras of ownership change in the Canadian coal industry but the current changes are somewhat more significant and signal real structural change in the industry. The 1970s and 1980s saw the entry of the large petroleum companies into coal and by the early 1990s most of these had left the business entirely in Canada and elsewhere. Shell and Exxon remain active internationally although Shell is actively selling out and Exxon has reduced its holdings.

Participation in the industry peaked in 1990 when 13 different companies operated Canadian coalmines. In that year the 5 largest producers accounted for 86% of total production

The departure of the oil companies from Canada was the first wave of the recent

consolidation, which has occurred in Canada as their mining assets were purchased by other Canadian coal companies. Changes in the last decade have also included corporate bankruptcies and the big sell-off of the late 1990s when both Luscar and Manalta went public and then were combined. There are 27 operating coal mines in Canada and every one (except Fording Coal Ltd's Fording River mine, Teck's Bullmoose mine and NB Coal's Minto) and every coal company (except one, NB Coal) have been involved in the mine or company ownership changes that have spread across the country in recent years.

Even though all is not said and done, in 2000 there are currently 7 operating companies but the 3rd largest account for over 96% of total production. Ongoing changes not yet finalized but in progress at the time of writing include Quinsam Coal Ltd, Smoky River Coal Ltd and Cape Breton Development Corporation all of which have their assets on the market.

New Resource Project Developments

While market developments and developments in the world of finance have create a trend toward concentration in the coal industry and competition has led to enormous gains in productivity at the best remaining mines a seemingly contraries activity is also underway. Even though mines and entire companies are disappearing, independent developers are bringing new projects forward with the potential to add to productive capacity. Such is the nature of the coal industry.

New projects have a chance because of the opportunity to bring new production on stream at modest initial production rates with very low capital cost. Some of the potential projects could also benefit from the existence of high quality infrastructure.

Properties that fall into this category are located in northeastern British Columbia and include Monkman (Smoky River Coal Ltd), Sukunka (Talisman), Willow Creek (Pine Valley) as well as Belcourt and Burnt River (Western Canadian Coal Corp.). Luscar's Telkwa property has some of the characteristics of this group and could also be included. Each of these properties has attributes, which would make them competitive in today's international marketplace although it has yet to be seen whether buyers for the coal can actually be developed.

These properties are all nearby or adjacent to rail and preparation plant infrastructure and have geological characteristics that will potentially allow for staged production with low initial capital costs.

Summary & Conclusions

There have been many changes during the long history of Canada's coal industry but the current period is proving to be one of the most interesting and dynamic. Firstly, market and technological factors have led to increases in productivity in coal mining and the effect has been to lower the average cost of production and increase the capability to supply coal to international markets and hence increase competitiveness.

On the other hand market and financial factors have led to significant concentration in the industry as the number of operators continues to decrease over time. The effect of these changes will be reduced number of operating mines as high cost producers are closed and supply is managed by fewer competing companies with a tendency to reduce competitiveness.

Yet another factor is the presence of potential new entrants attempting to add production with smaller scale, low cost mines developed close to existing infrastructure. These potential producers are being positioned to replace some of the higher cost mines that will likely close in the near or mid-term future and thereby add to the competitive situation in the business.

The three aspects of the changing coal supply situation and the effect of each dynamic are illustrated below. The large-scale improvements in productivity have the tendency to lower the cost of supply overall and/or increase the supply of coal at any given cost level. Concentration of ownership and rationalization of supply tends to remove higher cost sources of supply while new entrants struggle to insert new production, at lower cost, into the supply system (Figure 4)

Only time will tell how the coal supply situation is resolved but the Canadian industry is undoubtedly nearing a major watershed after which only the strongest companies with the best quality resources are likely to survive.

Canada has built a significant export industry over the past 30 years and remains a legitimate player in internationally traded coal. The market position has been retained by cost management at coal mines and increasing productivity over time. Metallurgical coal exports currently make up 85% of Canadian exports and, since Canadian steam coal generally has difficulty competing in Asia Pacific and elsewhere, will retain the lion's share of future exports.

The market for both metallurgical and thermal coal in Asia Pacific is a competitive one and developments suggest that competition will increase in the years ahead. This means for producers a continuing emphasis on production and transportation costs can be expected.

I indicated in past presentations that perhaps 3+ million tonnes of steam coal and 5+ million tonnes of coking coal exports were at risk at the present time, given the combination of events and circumstances of the past year. Exports have indeed fallen, although not for every company. This reflects the different competitive positions of each company and each export mine.

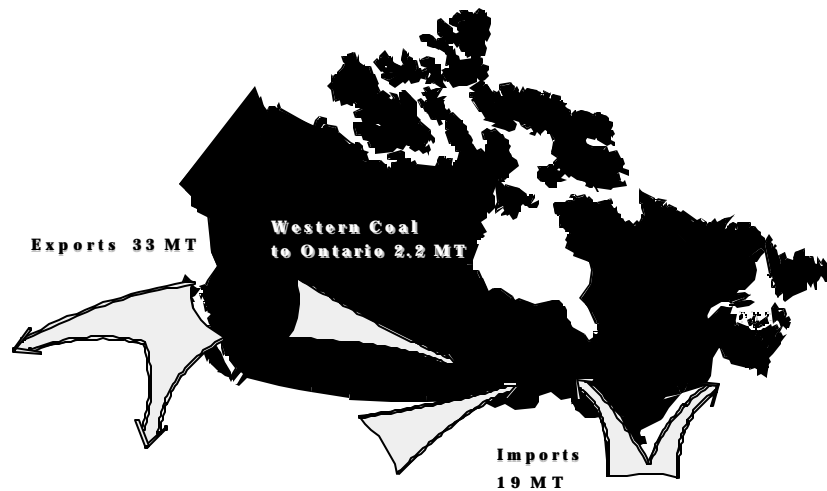


Figure. 1 Canadian Coal Flow 1999

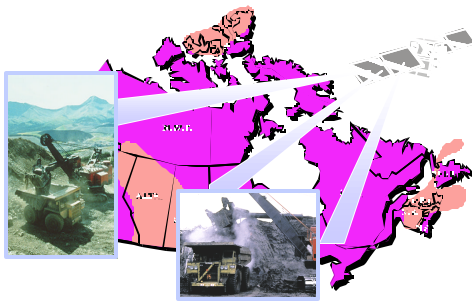


Figure2. GPS Systems Improve Operating Networking

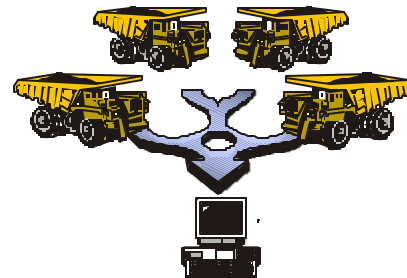


Figure3. Heavy Efficiency Duty Equipment

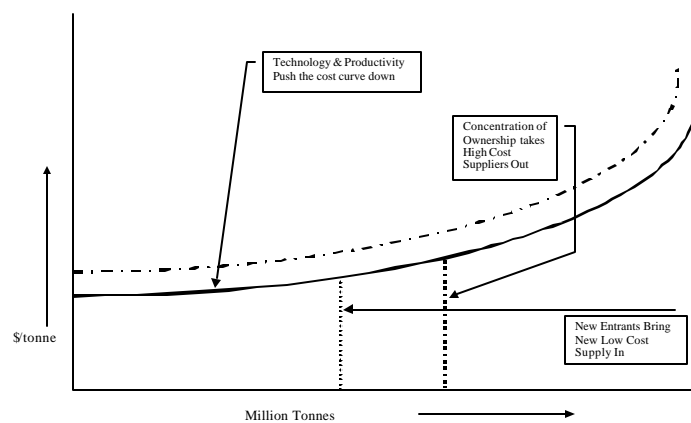


Figure4. Dynamics of Canadian Coal Supply
A Hypothetical Coal Supply Cost Curve